



CON-TEXTS ON CONCRETE



SURFACING CONCRETE
WITH



CONCRETE SURFACE CORPORATION
342 Madison Avenue New York City

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First Printing, October, 1925
Second Printing, November, 1925

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CON-SUR-CO PRODUCTS *and the*
CONCRETE SURFACE CORPORATION

Our Policy is:

To specialize in products that definitely improve the quality of concrete and of mortars in commercial use.

To publish informative literature that will be reliable office texts rather than sales propaganda.

To supply products of the highest standard of effectiveness and reliability only.

CONCRETE SURFACE CORPORATION
342 MADISON AVENUE
NEW YORK CITY



"CONCRETE OF BEAUTY IS CONCRETE OF PERMANENCE"

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Foreword

CONCRETE today is more than a construction material. Through widespread and manifold use it has become a public utility.

But in spite of this quantity employment, the fields proper to concrete are under restrictions.

One restriction is the appearance of concrete, particularly with passage of time.

Another restriction is the difficulty of securing bond between set concrete or mortars and new materials, such as plaster or new concrete.

A third restriction, and one that is deservedly gaining more attention and respect, is having assurance as to the quality of concrete as it is commercially produced and its permanence under normal conditions of service.

To remove these restrictions and to meet the needs of practical construction operations, Con-Sur-Co products for concrete were originated by Nathan C. Johnson, of Hool and Johnson, Engineers and Specialists in Concrete Construction of New York City.

Con-Sur-Co Products are unique in character and produce definite and measurable results. The key-note of their action and operation is to give full play to the natural abilities of Portland Cement and of the other materials in concrete and to supplement these abilities to an advantageous end.

And all Con-Sur-Co Products are designed to work one with another, without clash or interference.

THE SURFACE PROBLEM IN CONCRETE

The Surface Problem in concrete has existed since the first concrete was made.

This problem has three major divisions:

1. Producing an attractive surface appearance, both in color and in texture.
2. Producing a surface to which new concrete or mortar, or plaster or like materials will unfailingly and actually bond.
3. Producing a non-cracking, non-dusting, non-blotching and enduring surface which will effectively resist time, weather and wear.

The achievement of these results before the advent of CON-TEX was a matter of surpassing care and skill and of high cost.

A Few Facts About Concrete

The technical world today desires to understand the reasons for and the nature of processes employed. In view of the importance of the subject, a brief review of elementary facts may be pardoned.

Concrete, as everyone knows, is a mixture of sand and stone (or gravel) with Portland Cement and water. In due time the mixture "sets" and hardens to a rock-like mass.

Mortar, in like manner, is a similar mixture without the larger stone and possesses the same properties of setting and hardening.

Only one-seventh of concrete is Portland Cement in the usual mixtures; and not over one-third of mortars is cement. The sand and stone are fillers, *but they must be fillers of peculiar abilities*, for they physically and chemically bond with this small proportion of Portland Cement to form an exceedingly strong mass, although they have no free energy of themselves.

If these fillers do not possess the ability to thus utilize the energy of Portland cement, they are unsuitable for use as aggregates and may even slowly "poison" the concrete and bring about disintegration. An example of such aggregates is shale or clay in sand.

Portland cement as supplied by its makers is a material of tremendous, but dormant energy. Water is needed to release this energy. Other materials are needed to economically use the energy thus released.

With proper understanding of these things, concrete may be made as perfect as is desired, within the range of its natural limitations; and it no longer remains a problem.

The Form Skin of Concrete and Its Properties

The most conspicuous thing about concrete as it comes from forms, or about mortar or stucco as it is applied, is a surface covering of almost pure, or "neat"

Portland Cement. At form surfaces in particular, and at the top surfaces of exposed members such as roadways and floors, this covering of cement is particularly thick.

It must be recognized, therefore, that a tremendous amount of energy for either good or ill is concentrated at these surfaces, since the concentration of cement is so intense at these surfaces.

The Form Skin of Concrete and Appearance

To many people, the color of Portland Cement as thus concentrated at surfaces is not attractive. Unfortunately, cement possesses also the ability to receive and to stubbornly hold such marks as the grain of boards or the cracks or joints in forms, or like incidents to commercial work. These further disfigure the outer surface of form-cast concrete.

On the other hand, the sand and the stone inward of the mixture are themselves of great beauty, both in form and in color. But they are totally concealed by this outer skin of cement. So it is literally true that even if the stones in concrete were diamonds of the purest water and if the sand were gold dust of the highest karat, both would be as uselessly buried as though they lay in their original beds in the untouched hills where they were formed.

No matter what is used in the mixture, then, the outward result is the same—a product that is as hard as rock, but does not look like stone; that bears the look of boards, yet possesses none of the properties of wood, while the best values are concealed by a surface skin that is over-rich in cement.

The unattractiveness of this surface is tacitly admitted on every concrete construction, for as soon as possible this form skin surface is smoothed over, rubbed over, painted over with cement washes or other concealing means and *so far as Nature will permit*, its birth-appearance is forgotten.

But Nature may not be ignored for long. The tremendous energy concentrated at this form skin is quietly, but persistently and surely finding an outlet; and this outlet is made evident on countless structures throughout the world by scaling, by peeling and by a blotchy, unfortunate appearance which detracts measurably from the value of any structure and creates an impression of deterioration in structural strength that is not justified.

The Form Skin of Concrete and Bonding

This every-day sight brings forward the second division of the surface problem in concrete, namely, *securing an effective and permanent bond to the set and hardened form skin of concrete.*

New concrete and mortars and like substances have been *said* to bond with set and hardened concrete, but this is a phrase of courtesy, as is attested by numberless structures which have been up for varying periods of time and which certify to the contrary.

Such failure to bond is once again a manifestation of the tremendous energy of Portland Cement, modified by profound changes that have taken place in the

set and hardened cement skin as opposed to the unleashed and uncontrolled energies of the new cement—a sort of family quarrel that divides the house against itself, with the usual and well known result that such a house cannot stand.

Yet "skin-deep" are different and better values. Just below the surface skin are sand and stone which possess great abilities to bond with Portland Cement, while it is in a plastic stage.

If, therefore, the concealing surface skin is removed, or better, *if its formation is prevented*, these values at once become available for future use.

The Form Skin of Concrete and Endurance

CON-TEX, in its several grades, prevents the formation of this surface skin of concrete. This results in an exposure or "revealing" of clean sand and clean stone either as a finished surface appearance or as a bond with which other plastic materials will unfailingly and surely unite, just as though they were newly put into a newly made concrete mix.

And it is again to be borne in mind that sand and stone are of the highest endurance to weather and to the elements, while Portland Cement, by its very nature, may not be so.

The surface skin of cement is constantly absorbing water and changing in character by chemical combinations, with consequent erratic behaviour. But with 80 to 90 per cent of hard silicious material exposed to the weather and to wear in place of this alterable and erratic over-rich skin, constancy of behaviour and high endurance is assured. And the ultimate of absorption can reside only in the remaining 10 to 20 per cent of cementitious material to which the weather may find access between the exposed sand and stone.

An exposed stone-surface concrete has, therefore, a better expectation of life than can be had by a cement-covered concrete.

The Form Skin as a Factor in Cracking and Scaling

But there are other ways in which the cement skin plays an important part.

In the top surface of floors and of roadways, as well as in the form surface of form cast units, there is always, as before stated, a great concentration of cement. This material has no adequate outlet for its energies by having stone or sand present with which it may chemically and physically unite. It therefore seeks an outlet *within itself*, quite without regard for the sensibilities of the mass behind it and of which it is an integral part.

One manifestation of this energy is in self-destruction, which finds its evidence in dusting, as in floors, or in scaling, as in roadways and pavements. Another manifestation is found in that extraordinary volume change, the evidences of which are customarily designated as shrinkage cracks, or "sun-cracks," or crazings.

If these were confined to the surface layer alone, their existence would be comparatively unimportant, but it is fact that so strong are these actions in the skin

and particularly the action of shrinkage, that the volume change frequently ruptures the concrete mass behind or beneath it to a considerable depth, thereby admitting moisture and inviting other destructive and deteriorative actions, such as frost.

It would therefore seem that the form skin of concrete is not the protection and salvation of concrete which it once was assumed to be, but on the contrary, may be a restrictor, a destructor and a menace to permanence in concrete.

The Exposed Surface as Indicator of Mass Quality

And certainly, the usual form skin of concrete is a blinder and a deceiver.

Many a man has put his best into a job, only to find in a relatively short while that he was not proud of his own handiwork.

But with the obscuring form skin of concrete removed, the exact character of the work is evident at a glance.

If the mass is non-uniform, that is evident on the surface. If the pour contains a large percentage of slack material or muck, due to careless work by laborers or others, that also is made evident and in time to remedy it. If the mass is of a character such that it would have no water-withholding value, as in a reservoir, save for a form skin of very slight thickness, that fact is made evident in time to secure a proper repair.

The beginning of progress in the steel industry was the making of etched sections so that what was in the steel might be seen.

In like measure, it is definitely proven that a higher usefulness, as well as a better grade of work, universally results from knowing at the time of construction just what character of material is offered, rather than assuming that a thin "gravy" over the outside means an inward soundness which will resist stress of any and every kind.

The *strength* of concrete in an actual construction, even if it is a poor grade of concrete, is usually sufficient to bear any load that is likely to be put on it. But though strong, such a concrete may disintegrate, or not be permanent under exposure to water, whether salt or fresh. And always, so far as experience goes, an impermanent, non-waterproof concrete has a non-uniform and faulty appearance when the outer skin is removed and the structure of the mass is made evident.

But if the revealed surface appearance of any concrete shows an even, homogeneous, sound structure, the endurance and the permanency of that concrete, as well as its high-strength, waterproofness and other desirable qualities, may be depended upon.

From long experience in these matters we feel justified in our slogan: "Concrete of Beauty is Concrete of Permanence."

How Con-Tex is Used to Surface Concrete

The majority use of concrete is form-cast work, so that Standard CON-TEX and its use in form work will be first explained.

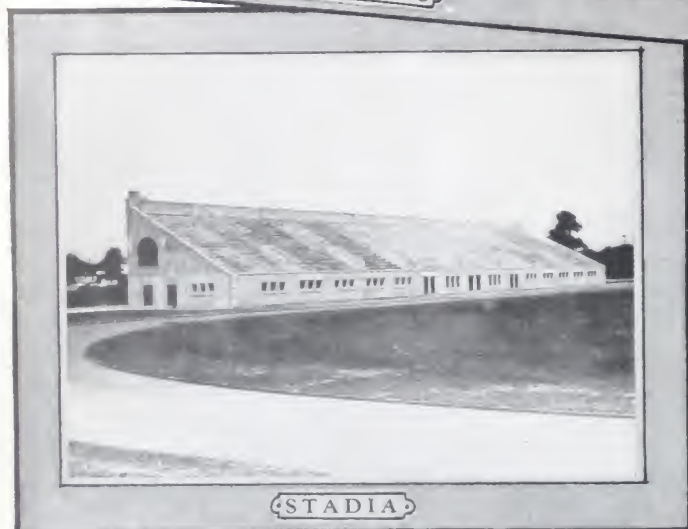


{BUILDINGS}



{BUILDINGS}

CONCRETE SURFACE



{STADIA}



{ENCLOSURE WALLS}

CONCRETE



{ENCLOSURE WALLS}



{VIADUCTS}

OVER 1,500,000 SQUARE FEET OF CONCRETE SURFACE HERE



TOP SURFACES



SPANDREL WALLS



ENCLOSURE WALLS



BRIDGES



BRIDGE RAILINGS



PLASTER-BOND



HERE AND ABROAD ATTEST THE VALUE OF CON-TEX

Standard CON-TEX is a full-bodied, quick-drying liquid. This is brushed on the forms in an easily applied flow-coat. As it is reddish in color, even a laborer can be sure where it has been applied, so that all parts of the form are thoroughly covered.

In a short time—twenty minutes to an hour, dependent on the temperature prevailing—the CON-TEX is dry; and when it is dry, CON-TEX is practically unaffected by rain or snow or other weather conditions.

This means that forms can be and usually are coated with CON-TEX well in advance of the concrete work.

The forms are filled when ready. When the concrete has set, the forms are removed. Much of the unset material affected by CON-TEX comes away with the forms. The rest is then brushed off like loose sand, with wire brushes, or, if sufficient water is available, washed off with a hose stream.

A finished, permanent surface of exposed aggregates results from these simple operations.

There is no mechanical plant. And as the work is completed at once, there is no retained percentage, nor insurance, nor overhead to cut down profits.

Grades or Strengths of Standard Con-TEX

There are six "Grades" of Standard CON-TEX known as A, B, C, D, E and Bonding Grade CON-TEX.

Each is suited to give a definite depth of reveal, or depth of action.

Based on the cement content of a usual 1:2:4 mix, the following table may be referred to in specifying and in ordering Standard CON-TEX:

For Fine-Surface Molds of Metal, Plaster or Wood

Grade A gives about 1/16 inch reveal—used only for grits and like size.

Grade B gives about 3/32 inch reveal—used with grits to 1/4 inch in size.

For Wood Forms or Metal Forms in Field Use

Grade C gives about 3/16 inch reveal—used with 3/8 inch to 1 inch in size.

Grade D gives about 5/16 inch reveal—used with 1/2 inch to 1 1/2 inch in size.

Grade E gives about 1/2 inch reveal—used with 3/4 inch and larger stone.

For Bonding work—Bonding Grade CON-TEX gives about 5/16 inch reveal—use any size stone over 3/8 inch on horizontal surface work. For Bonding on vertical surfaces, use Grade E and any size stone over 3/8 inch.

Bonding Grade CON-TEX may also be used with cinder concrete, but when cinders are to be used, please notify us, as we prefer a special Cinder Bonding Grade which we make up only on order.

CON-TEX acts on the surface cement in concrete only. In hot weather work, therefore, it is better to use Grades D or E with any stone over 3/8 inch in size, since the CON-TEX effect must take place before final set.

In hot weather, as is well known, cement sets so rapidly that these higher grades are used to insure a thoroughly reliable result.

The Costs of Standard Con-Text Surfacing

The following comparison of costs for old methods of surface finishing as compared to a CON-TEX surface has been compiled from reliable data:

Point-Tooling—power	34c sq. ft.
Brush hammering—power	12 - 27c sq. ft.
Brush hammering—hand	15 - 37c sq. ft.
Carborundum rub	10 - 17c sq. ft.
Wash and float—hand	6 - 9c sq. ft.
CON-TEX SURFACING	2 1/2 - 6c sq. ft.

All of the foregoing costs are for labor and materials inclusive.

Labor in applying CON-TEX to forms *and* brushing off the concrete surface after removing forms costs about 1c per sq. ft. as an average. Forms are broomed off as usual, or washed off with a hose.

The cost of CON-TEX depends on the total area contracted for. Quantity quotations on estimated areas promptly furnished on request.

The spread of Standard CON-TEX averages 175-200 sq. ft. per gallon, assuming three uses of forms. For one use of wood forms, the spread is about 140 sq. ft. per gallon, as two coats are required on first use, and one coat on each re-use.

Panelled Surfaces with Con-Text

Architectural relief is needed on surfaces of any material, whether stone or brick or concrete, else they may be monotonous.

Such architectural treatment of CON-TEX surfaces is easily given on concrete by panelling; and panelling is readily accomplished by tacking half-round or flat nosing to the forms and applying Standard CON-TEX within these borders.

This gives clean, sharp arrises as well as an agreeable contrast by leaving plain borders to receive the usual rubbed finish. Or, if no plain work is desired, by brushing CON-TEX on the whole form, nosings and all, architectural treatment in line and form may be obtained.

Contrasts may also be secured by using different grades of CON-TEX, thus securing lighter and deeper reveals in adjacent areas.

Standard Con-Text for Bond on Ceilings and Beam Soffits and Walls

Plastering or tile setting or stucco work applied to the skin surface of concrete has always an element of uncertainty. The skin surface of concrete and the applied

materials have dissimilar natures and dissimilar coefficients of expansion, so that loosening and scaling take place.

But if CON-TEX is applied to forms before casting concrete, a "sure-fire" bonding surface of revealed aggregates can be obtained.

For horizontal surfaces, Bonding Grade CON-TEX is generally used. It is not suited to vertical wall work. It is designed for ceiling and beam and stair soffit bonding and like work and is cheaper than Standard CON-TEX, although its nature, action and results are similar.

Standard Con-Tex for Finished Ceiling Work

Furthermore, many ceiling surfaces as revealed by CON-TEX are sufficiently fine to serve without plastering. Or, they may be plastered at any time, either when the structure has yielded returns or during the original construction period.

In passenger tunnels at railroad stations and in like uses, a CON-TEX surface is both a finished surface and a guarantee against disfigurement by vandals.

Standard Con-Tex for Pre-Cast Units

With Standard CON-TEX, facing stones in any size, window and door sills, lintels, balustrades and other objects without number may be made on the job.

The procedure is easy—merely coating the forms with CON-TEX, casting the units and washing them off when removed from the forms.

Fancy moldings are easily produced by using the inner side of standard metal cornice moldings as a form and coating these with CON-TEX.

Face-down work of this character is exceedingly easy to do. Where desired, a facing material of selected aggregates and white cement, with a backing of cheaper materials poured integral may be used.

Standard Con-Tex in Top Surface Work

Ornamental top surface work with CON-TEX is readily done by (1) placing the concrete; (2) allowing it to lose its free surface water, but not set; and (3) flowing a proper grade of Standard CON-TEX over the surface.

About twenty-four hours later, wash off or brush off the surfaces, removing both CON-TEX and the loosened material.

A finished surface of clean stone, firmly bedded in the base, will result.

The grade of CON-TEX used should be suited to the reveal desired and to the size of stone in the concrete.

Such surfaces are plaza areas, pavements, surfaces of private roadways, ornamental borders, pool bottoms, etc., etc.

Standard Con-Tex in Top Floor Bond

Top floors may be lastingly and effectively bonded to under floors by exposing clean sand and clean stone at the top surface of the underfloor by means of CON-TEX.

If, therefore, as an underfloor is placed and levelled off, Standard CON-TEX is applied to the top surface as the work progresses, clean aggregates, firmly bedded in the under concrete, will be obtained by a brooming off or washing off of the surfaces so treated at about twenty-four hours later.

When the top floor is later laid on this surface of clean, exposed stone, it will effectively bond with it, so that the entire floor is a true monolith and structural credit may be obtained for the full slab thickness.

The Use of Con-TEX in Bonding Lifts and Sections

In water-holding structures, such as reservoirs, dams, etc., which tend to leak at construction joints and planes, a true bond may be obtained (1) by coating bulkheads with Standard CON-TEX and (2) by using CON-TEX on horizontal lift surfaces. This makes the structure as though cast in one piece.

Or in other uses, such as at expansion joints of roads and the like, easy removal of the bulkheads may be had by coating the bulkheads with Standard CON-TEX. The same applies to other members which it is desired to remove from concrete.

Coating bulkheads of floor arches with Standard CON-TEX and revealing firmly bedded aggregates, ready to bond with the next pouring, gives slabs that are true monoliths.

Spraying Con-TEX and its Uses

Spraying CON-TEX is as effective in its fields as Standard CON-TEX, but is suited to different uses.

Spraying CON-TEX is of lighter body than Standard CON-TEX and therefore *cannot be used on forms*. But it has applications where the heavy-bodied Standard CON-TEX cannot be advantageously used.

Spraying CON-TEX, as its name implies, is suited to being sprayed directly on mortars and stucco and concrete by means of hand or power atomizing sprays. There is only one Grade of Spraying CON-TEX; and the depth of reveal desired, unlike Standard CON-TEX, is obtained by the amount applied. This amount is judged by the temporary color resulting from its application.

Spraying CON-TEX may also be applied with a soft brush instead of a spray.

Spraying Con-TEX in Stucco Work

Stuccos of any desired color and texture may be obtained by selecting aggregates of the desired color and using Spraying CON-TEX in a light application with a hand atomizer, such as is used for spraying plants.

This gives to stucco the natural color of the stone, with a delicate texture that in no way resembles pebbles or bits of stone dashed into stucco, or any of the dead-color stucco finishes.

Spraying Con-Tex and Standard Con-Tex in Composite Construction

Where desired, also, a concrete structural shell, with surface exposed for bond by Standard CON-TEX, may have applied to it a special finish of selected aggregates and white cement, with these aggregates exposed for color and texture by Spraying CON-TEX. (See back cover page.)

The effect is all that could be desired and the stucco coat will unite to the exposed aggregate of the structural shell with full assurance of integrity and lasting qualities.

It is important to note also that stuccos treated with Spraying CON-TEX do not crack or craze, as the usual skin tension is prevented by CON-TEX.

Spraying Con-Tex in Sidewalk and Roadway Work

Dusting, crazing, scaling, dishing and cracking of the tops of sidewalks and roadways are difficulties often met with.

A light coat of Spraying CON-TEX relieves these difficulties, as it prevents those actions which cause these undesirable conditions. We can provide spraying CON-TEX giving *no reveal* if desired, but preserving the surface against cracking, dusting and scaling.

Please also advise us when CON-TEX is ordered for work of this character, so that a special instruction sheet may be sent.

A light reveal or no reveal may be had as desired. Please advise us fully of your requirements.

Characteristics of Con-Tex

Both Standard CON-TEX and Spraying CON-TEX possess the following general characteristics:

CON-TEX is not acid, and does not "eat" or corrode as acid does. CON-TEX can be used on either steel or wood forms.

CON-TEX embodies a rigid, absolute and even control of the non-setting action. This insures reliability and safety; and is the key-note of successful use. The non-setting action of CON-TEX is not continuing and cannot go deeper than intended.

CON-TEX is fully exhausted with each use. This valuable property of CON-TEX means that forms coated with CON-TEX may be re-used for plain surface work, or may be again coated with CON-TEX for further revealed-surface work.

CON-TEX preserves forms, permits a greater re-use of forms and minimizes warping.

CON-TEX will not affect set and hardened concrete.

CON-TEX will not freeze in cold weather or spoil in hot or humid weather.

CON-TEX is supplied in one gallon cans only, as these have been found most economical on the job and permit easy handling.

SPECIFICATIONS FOR CON-TEX

It is best to specify CON-TEX by name. The following form is commonly used.

"All concrete surfaces shall be surface finished by the use of CON-TEX as made by the Concrete Surface Corporation, 342 Madison Avenue, New York City. CON-TEX shall be used and applied and the concrete shall be treated in strict accordance with the manufacturer's directions. The reveal desired on each portion of the surface is marked on the plans; and the proper grade and kind of CON-TEX shall be used to obtain this reveal.

Specifications for Bonding with Con-Tex

"All surfaces to which plaster, tile, stucco or other applied materials are to be applied, shall have bonding surfaces of clean aggregate produced by CON-TEX as made by the Concrete Surface Corporation, 342 Madison Avenue, New York City. This shall be used and applied in strict accordance with the manufacturer's directions, and a proper grade and kind of CON-TEX for the work in hand shall be used."

Specifications for Public Work When Trade Names May Not Be Used

"All concrete surfaces shall be surface finished by the use of a liquid material painted on the forms before placing concrete or on the concrete itself to obtain a revealed aggregate surface. The material used to produce this surface finish shall be an approved liquid coating for the forms or in top surface or stucco work, applied to the concrete or stucco before it has set, and meeting the following requirements: It shall be composed of a colloidal base carrying active materials which latter shall operate only after coming in contact with the alkaline fluids of the concrete. This coating liquid shall not contain free acid; shall not contain any ingredient that will injure the aggregate, the reinforcement or the forms; shall dry quickly, and after drying shall not be injured by rain, snow or freezing; and there shall be no after effects injurious to the concrete or to applied materials. All surfaces or forms for surfaces specified to be of textured concrete by exposing aggregates, shall be given an even coat or coats of this liquid, taking care to completely cover all areas.

"Where such coating is applied to forms, after removal of forms the loosened surface of the concrete shall be immediately removed with wire brushes or other effective and approved means, and the concrete then thoroughly washed with hose or scrubbed with bristle brushes."

"Where such coating is applied directly to concrete or to stucco, the surfaces treated shall be thoroughly cleaned of the coating and of loosened material at about 24 hours after applying, so that clean aggregates shall be evenly exposed throughout the areas treated."

Specifications for Spraying Con-Tex on Stucco

"All stucco surface as indicated on the plans to have a revealed surface shall have a surface obtained by means of SPRAYING CON-TEX as made by the Concrete Surface Corporation, 342 Madison Avenue, New York City. This SPRAYING CON-TEX shall be used and applied in accordance with the manufacturer's directions."

Specifications for Spraying Con-Tex on Floors, Roadways, Sidewalks, Etc.

"All top surface on floors (pavements, roadways, etc.) indicated on the plans to be treated against cracking, dishing, etc., shall have applied to them immediately after screeding and finishing, a spray-coat or light wash coat of SPRAYING CON-TEX as made by the Concrete Surface Corporation, 342 Madison Avenue, New York City. This material shall be used strictly in accordance with the manufacturer's directions; and a proper kind shall be used to produce the reveal desired."

CONCRETE AND THE MAKING OF CONCRETE

No effort has been spared to make CON-TEX a perfect product. With concrete made and placed according to our special directions sent to every user of CON-TEX, the results are fully successful.

But it is to be borne in mind that no matter how great the knowledge or skill of the heads of any contracting organization, the actual making and placing of concrete is in the hands of laborers.

We have no theories to advocate, but we know from long experience with these field conditions how to secure proper results and to cut out guess-work in the making of concrete.

Contractors are guided by specifications. To the end that the best grade of work may be secured, we would ask that the following provisions be written into specifications where concrete is to be used in CON-TEX work and that any provisions conflicting with these be omitted:

1. THE MIX SHALL BE PROPORTIONED ON THE BASIS OF 1:2 MORTAR AND AS MUCH STONE SHALL BE ADDED AS THE MIX WILL CARRY. The exact proportion shall be determined on the job by trial with the materials to be used.

2. WEIGHT MEASUREMENT OF SAND AND STONE SHALL BE USED THROUGHOUT. (Weight measurement is easily accomplished by a simple job-made rig and is always accurate. No other method excels weight measurement in accuracy and no other method puts the proper quantity of stone into the mix, batch by batch. We can furnish dimensioned prints for an accurate and economical job-made weighing rig at a price of \$15.00.)

3. A FULL PLASTIC CONSISTENCY SHALL BE USED IN ALL CONCRETE. Sloppy mixes and dry mixes shall not be permitted.

4. ALL CONCRETE SHALL BE DEPOSITED THROUGH CANVAS TUBES, OR OTHER EFFECTIVE MEANS SHALL BE USED TO PREVENT COATING OF STEEL AND FORM SIDES WITH SPLASH.

(Splash builds up heavy layers of neat cement on form sides and on the steel. On the form sides these layers keep stone away from the surface. On steel they build a covering around the steel which dries rapidly and has no cementing value, so that bond is deteriorated. Depositing through a canvas tube about 10 inches in diameter is easy and convenient and materially improves the quality of any concrete work, since large quantities of cement are not used up in coating forms, but are kept in the mix, where they belong.)

5. FORMS SHALL BE DIVIDED BY BULKHEADS INTO SECTIONS CONVENIENT TO POUR TO A FULL HEIGHT IN ONE CONTINUOUS OPERATION. The location of these sections shall be arranged in conference between the contractor and the architect or engineer and shall be rigidly adhered to. Bulkheads shall be CON-TEXED to secure true bonding between the section poured and the sections later poured. After removal of the bulkheads, these surfaces shall be cleaned of all loose material so that clean stone is exposed for bonding with the next pouring of concrete.

6. ALL POUR LINES AND ALL POURING SHALL BE KEPT EVEN AND HORIZONTAL.

To insure pour line being even at tops of lifts, a beveled 2 x 4 in., coated with CON-TEX, shall be lightly nailed to the form at the designated pour line level.

The concrete shall rise on the first pouring within a half inch of the top of this 2 x 4 in.; and twenty-penny spikes projecting inward from this 2 x 4 in. shall be used to retain this beveled piece in place.

This secures a tight joint with forms and next lift; and when the work is completed, this 2 x 4 in. shall be removed, the spaces brushed out to secure bond, and the joint hand-packed with concrete of similar composition to that in the adjacent parts of the structure. This filling concrete shall be allowed to set but not to harden; and shall then be brushed out with wire brushes to an even texture corresponding to that of the adjacent concrete. When fully hardened, the patch shall be thoroughly cleaned with muriatic acid, then washed off with water.

7. ALL CONCRETE SHALL BE CONTINUOUSLY PUDDLED DURING PLACEMENT THREE OR FOUR INCHES AWAY FROM THE CON-TEXED FORM FACE IN ORDER TO BRING STONE TO THE SURFACE AND TO PRESERVE AN EVEN MIXTURE IN THE MASS.

8. AT THE TOP OF EACH POURING PLANE OR STOPPAGE POINT DRY STONE SHALL BE ADDED UNTIL THE LIFT IS CHOKED WITH STONE AND THIS SHALL BE THOROUGHLY PUDDLED INTO THE FINE MATERIAL THAT RISES TO THE TOP. (There is *always* a rise of fine material on all concrete. Nature has decreed that stone shall sink. This means that fine material, consisting of sand with an ample quantity of cement, rises to the top. To keep the mix uniform, extra stone must be added and puddled in.)

Certain Points to be Remembered and Preferably Put in Specifications

1. Whenever possible select aggregates of a color that will contrast with the color of set and hardened cement mortar.

Quartz and silica gravel usually contrast well with mortar. Lime stone, trap rock, grey sand stone and aggregates of like character do not always contrast well but an agreeable contrast can be easily secured by incorporating a proper amount of color in the mortar.

We are prepared to furnish high grade mineral colors in paste form for these purposes. A separate circular covering Con-Sur-Co Colors may be had upon request.

2. White Portland Cement furnishes agreeable contrasts with practically any color of aggregates. White Portland Cement is more expensive but gives exceedingly fine results.

Additional contrast may also be had by proper panellings or proper combinations of CON-TEX work and plain finish work as described on page 10 of this circular.

3. In the usual type of concrete mix, one sized stone or gravel is to be preferred to graded or varied size ballast. One sized stone or gravel does not segregate. Graded or varying sized ballast always tends to segregate in forms thus producing an uneven appearance.

It is difficult in most commercial operations to secure a truly one sized ballast, but if an effort is made to approximate as closely as possible to one size, the result will be more fortunate than where a varied size aggregate is used.

In using crushed stone as ballast, do not use too large stone. Gravel has a "ball-bearing" value that enables easy placement, but large crushed stone tends to bridge in forms, thus leaving open sinkages below each bridging.

4. To overcome the tendency of ballast to sink and to segregate in concrete and also to make concrete more free working and to give better all-around results, we recommend the use of our Mix Stabilizer in the mix.

A pamphlet descriptive of Con-Sur-Co Mix Stabilizer, its properties and values, may be had upon request.

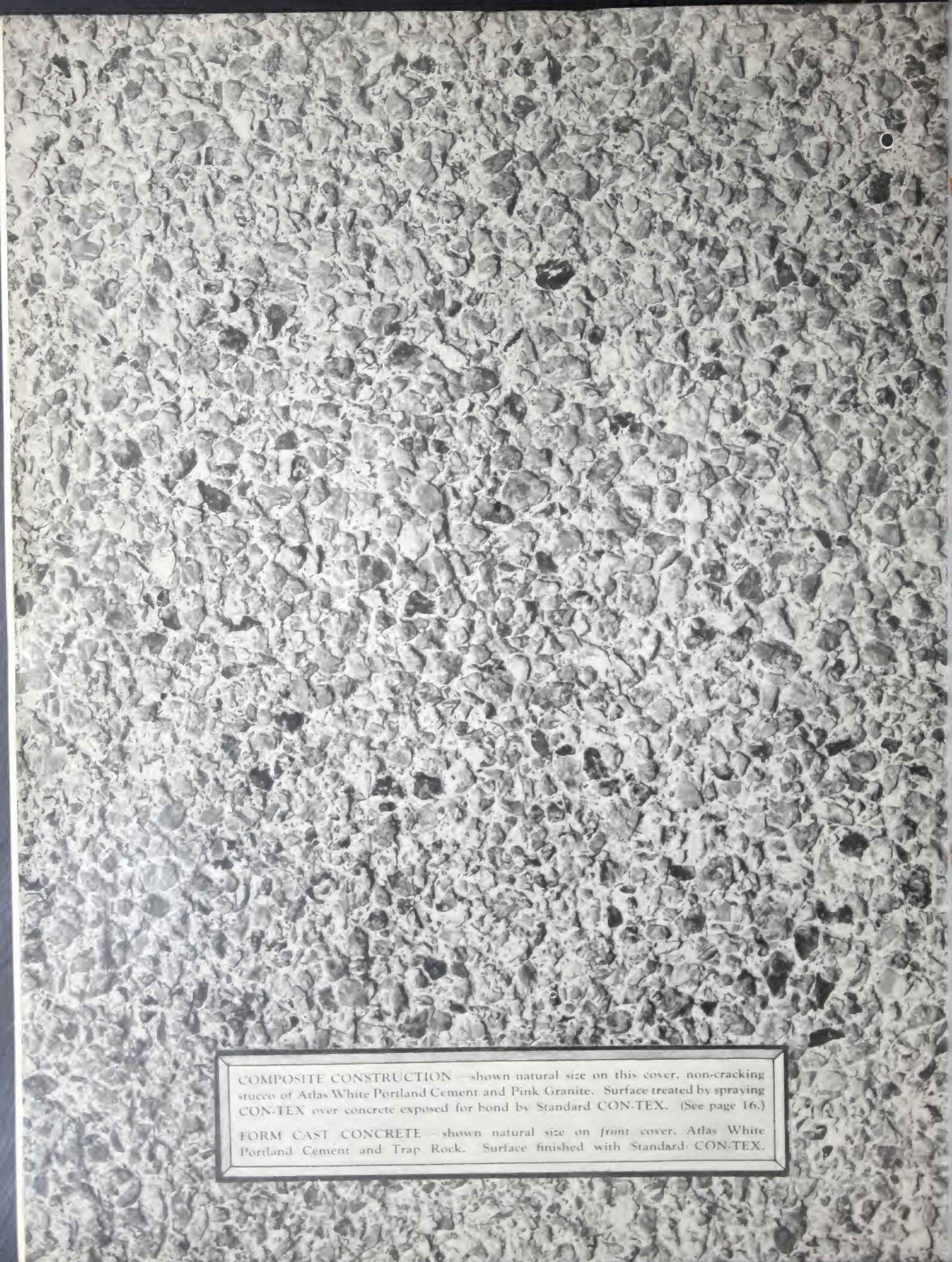
5. The smallest sizes of stone in a mix tend to accumulate at the form face. This means that the size of the ballast desired to show on the face should be chosen as the minimum size in the mix. This size is determined by the texture desired.

Con-Sur-Co Mix Stabilizer mentioned above, tends to smooth out and to lessen this characteristic so that where a somewhat non-uniform texture is desired it may be had by the use of the Mix Stabilizer with varied-size ballast.

6. Use stone from a single source, sand from a single source, and cement from a single source throughout a job in order that the color of the concrete may be uniform.

7. Do not permit reinforcing steel to be leaned against the forms.

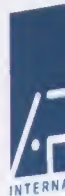
The usual practice in this respect of leaning steel against the forms and prying it back during placing until a little film of cement gravy covers it, has caused much trouble, as steel soon rusts and spoils the concrete. Temperature steel should always be in the middle of the form and other steel at least an inch from the form faces and firmly held in position.



COMPOSITE CONSTRUCTION —shown natural size on this cover, non-cracking stucco of Atlas White Portland Cement and Pink Granite. Surface treated by spraying CON-TEX over concrete exposed for bond by Standard CON-TEX. (See page 16.)

FORM CAST CONCRETE —shown natural size on front cover, Atlas White Portland Cement and Trap Rock. Surface finished with Standard CON-TEX.

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